REMARKS

Claims 1-30 are pending in the present application. Claims 1-30 are rejected under 35 U.S.C. 103(a). Claims 1, 16, and 23 are amended. No new matter is added. The rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Claims 1-3, 5-6, 9, 12, and 14-30 were rejected as being obvious over either Moribe et al. or Takemura et al. in view of Halter et al. The Examiner writes, in part:

> Both Moribe et al. and Takemura et al. disclose optical records having disc shaped substrates, wherein both servo information and recording areas are provided in "land" areas. See the abstract, Figure 22b and the accompanying description in Moribe et al.; in Takemura et al., see the abstract, fig. 2 and the associated description thereof - also col. 5 lines 35 plus.
>
> It would have been obvious to modify the base system . . . with the above "bumps" since either pits or bumps are equivalent structure/phrase for describing such structure(s).
>
> The recording material in either of the base references if phase changing, and inherently the data densities in the servo and writable areas are different.

Moribe et al. disclose an optical disk 281 having alternating lands 282 and grooves 283. (Moribe, col. 22, lines 58-62; Fig. 22B). "A recording layer 284 made of a magneto-optic material . . . is formed on the entire surface of the land 282 and groove 283." (Moribe, col. 22, lines 62-64). "ROM information pits 286 are formed at parts of the land 282", where the ROM information "is written beforehand." (Moribe, col. 23, lines 4-5 and 44-48). Other information on the disk include ID signal pits 285 on the land and ID signal parts 287 on the groove. (Moribe, Fig. 22B). A "majority of the groove 283 can be used as in the write region 288." (Moribe, col. 23, lines 44-45; Fig. 22B). Thus, Applicants believe that with the disk of Moribe, information is only writable to the groove, with information pits are pre-formed on the lands and grooves, with ROM pits formed on the lands.

In contrast, claim 1, as amended, recites "bumps formed on a first portion of the

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circular substrate, wherein the bumps represent pre-recorded information; lands formed on a second portion of the circular substrate; and a . . . phase-change material having a first state when unwritten and a second state when written to, wherein information is written only to the phase-change material on the lands". Applicants' invention, as recited in claim 1, is distinct and patentable over Moribe for several reasons, including, but not limited to the following.

First, bumps, representing pre-recorded information, are formed. As the Examiner points out, Moribe discloses "pits" instead of "bumps", but states that "'bumps' is considered merely an alternative phrase" and that "[a]lternately, if applicants can convince the examiner that such is not the case, then the examiner would further rely upon Halter et al. for teaching 'bumps' in this environment."

Applicants contend that pre-formed ROM pits are very different than bumps and is not just an alternative phrase. **[Dave, please provide some details here as to the Examiner's statement that bumps are just an alternative phrase for pits, preferably supported by the specification.]** As set forth in Applicants' Prior Art section, information is stored in pits, where detection of the pits is based on optical contrast detection between the planar region and the pits. In fact, Halter, which the Examiner cites for disclosing bumps, is very different from the pits disclosed in Moribe. In Halter, the bumps 28, firstly, represent writable information, not pre-formed ROM information. Secondly, the bumps are not formed on a surface of the disc, rather they are formed under lands 18 and grooves 16 and under a compression layer 20. (Halter, col. 4, lines 17-19; Fig. 1). Bumps are formed by transmitting a focused laser beam 30 through the disk, where the expansion layer 26 absorbs the energy, expands, and causes a bump 28' and 28 to be formed through retention layer 22. The information or bump can be erased by applying a laser beam with a different wavelength to heat the retention layer and flatten the bump in the expansion layer. (Halter, col. 5, line 66 to col. 6, line 22; Fig. 1). This is very different and not analogous to the pre-formed ROM

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information pits of Moribe.

A second point of distinction between Applicants' claim 1 and Moribe is that Moribe discloses both ROM information pits 286 and ID signal pits 285 re formed on the land 282, as shown in Fig. 22B and discussed above. So, even assuming arguendo that ID signal pits 285 are part of the writable portion of the disk, they are on the same land 282 as the ROM information pits 286. This is in contrast to claim 1, which recites "bumps formed on a first portion of the circular substrate, wherein the bumps represent pre-recorded information; lands formed on a second portion . . . wherein information is written only to the phase-change material on the lands". Thus, according to Applicants' invention, the pre-recorded information (bumps) is not formed on the lands, where information is written.

Thirdly, Moribe discloses the recording layer made of a magneto-optic material, such as a DyFeCo alloy. Magneto-optic materials are characterized by a change in optical properties when a magnetic field is applied, e.g., left and right circularly polarized beams see a different effective refractive index in the material with an applied magnetic field. This, again, is very different from the phase-change material recited in Claim 1, which has two different physical states. As disclosed in Applicants' specification at page 13, lines 11-14, a "phase-change material refers to materials that change physical structure, and in some cases also have an inherent optical phase shift." Typically, in the phase-change material, one state is amorphous and the other state is crystalline, which makes the disc write once read many (WORM). Therefore, the magneto-optic materials of Moribe patentably distinct over the phase-change material recited in Claim 1.

The Examiner also cites Takemura. Takemura discloses a second surface disk, in which recording marks 13 are written on both lands 11 and grooves 12, as shown in Fig. 2. Furthermore, the "recording mark 13 can be rewritten by again emitting a laser beam of controlled intensity to the same area." (Takemura, col. 5, lines 58-60). Also, as the Examiner

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notes, Takemura discloses pits 15 in land surface 14. Pits 15 are ROM marks. (Takemura, col. 6, lines 5-7).

In contrast, Claim 1 recites that "information is written only to the phase-change material on the lands". Writing to both lands and groove would decrease the contrast resolution when detecting written marks on the disc. Further, as discussed above, the phase-change material recited in Claim 1 changes physical structure, such as from amorphous to crystalline state when exposed to a laser. However, Takemura discloses a "phase-change recording film 16", where light can "effect a physical change such as a local change in the refractive index at the area of incidence", that "can be rewritten by again emitting a laser beam of controlled intensity to the same area." (Takemura, col. 5, lines 51-60). Thus, the film in Takemura can be rewritten, while the phase-change material of Claim 1 can only be written to once. Such a film, although only having the ability for a write-once, provides numerous other benefits for the disk recited in Claim 1, which are detailed in Applicants' specification.

Therefore, for the reasons discussed above, Applicants believe Claim 1 is patentable over Moribe or Takemura in view of Halter.

Independent Claim 16, as amended, recites "a pre-recorded portion comprising bumps and planar regions; a writable portion, separate from the pre-recorded portion, comprising lands . . .; and a phase-change material . . ., wherein information is written only on the lands, and wherein the phase-change material changes physical states when exposed to energy."

Accordingly, for reasons similar to those discussed above with respect to Claim 1, Claim 16 is patentable over the cited references.

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Independent Claim 23, as amended, recites "forming bumps . . . on first portions of a substrate; forming lands on second portions of the substrate . . . wherein prerecorded information is read from the bumps and written information is written only to and read from

the phase-change material deposited on the lands, and wherein the phase-change material changes physical states when exposed to energy."

Accordingly, for reasons similar to those discussed above with respect to Claim 1, Claim 23 is patentable over the cited references.

Claims 2, 3, 5, 6, 9, 12, 14, 15, 17-22, and 24-30 depend on Claims 1, 16, and 23 and are therefore patentable for at least the same reasons as Claims 1, 16, and 23.

Dependent Claims 4, 7, 8, 10, 11, and 13 were rejected as being unpatentable over the art as applied to Claim 1, in further view of Muller, Nakashima, Pan et al., Igarashi, and Nakamura et al. However, neither Muller, Nakashima, Pan et al., Igarashi, nor Nakamura et al. remedy the deficiencies of Moribe, Takemura, and Halter, as discussed above with respect to Claim 1. Therefore, Claims 4, 7, 8, 10, 11, and 13, which depend from Claim 1, are patentable over the cited references for at least the same reasons as Claim 1.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a).

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CONCLUSION

For the foregoing reasons, Applicant believes pending Claims 1-30 are allowable, and a notice of allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Attorney at (949) 752-7040.

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Commissioner for Patents, Alexandria, VA, 22313-1450, on November 6, 2003.

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November 6, 2003

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